MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

STATUS OF THE FISHERIES

IN MICHIGAN WATERS OF

LAKE ERIE AND LAKE ST. CLAIR

2011

Wild muskellunge x northern pike hybrid caught in Lake St. Clair survey trap net, May 2011

Michael Thomas and Todd Wills
Lake St. Clair Fisheries Research Station
Website: http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_10951_11304---,00.html

Prepared for the GLFC Lake Erie Committee Meeting
Windsor, Ontario
March 22, 2012

Highlights for 2011

The purpose of this report is to provide an update on the status of the fisheries in the Great Lakes and connecting waters of southeast Michigan. Sources of information used in compiling this report include creel surveys, charter boat reports, an angler diary program, the Master Angler program, and commercial fishery records, as well as fisheries survey results. Some of the highlights described in detail include:

- 2011 non-charter angler harvest rates for Lake Erie yellow perch were the highest recorded since the current creel survey system was initiated in 1986.
- Michigan non-charter anglers on Lake Erie caught over 50,000 walleye and harvested about 44,000 of those fish. Anglers reported releasing slightly higher numbers of sub-legal size walleye in 2011.
- Charter boat harvest rates for Lake Erie walleye were more than 4 times those estimated for non-charter anglers, while yellow perch charter boat harvest rates were 45% less than those estimated for non-charter anglers.
- Lake St. Clair is the premier Michigan water for trophy muskellunge and smallmouth bass based on the number of entries recorded in the Master Angler program in 2011.
- 2011 Lake Erie index gill net catch rates for Michigan waters were 25% higher than 2010, but less than half of the 1978-2010 average.
- Rock bass, smallmouth bass, and channel catfish were the dominant species in the Lake St. Clair trap net survey in 2011. Over 20% of the channel catfish exceeded Master Angler minimum length.
- Long-term tagging studies on Lake Erie walleye stocks clearly illustrate the important contribution of Lake Erie walleye to the Great Lakes sport fishery of Southeast Michigan, from Port Huron to Toledo.
- Tagging studies of lake sturgeon in the connecting waters since 1997 have demonstrated that lake sturgeon routinely move between Lake St. Clair and the St. Clair River. Longer range movements between the St. Clair system and southern Lake Huron are also frequent.

Fishery Forecast for 2012

Annual variation in reproductive success of walleye and yellow perch can result in substantial year to year changes in their abundance. Harvestable-size yellow perch abundance will be lower than last year in Lake Erie, with strong contributions from the 2007, 2008, and 2009 year classes expected. Although Lake Erie walleye abundance is expected to remain about the same in 2011, the average size of walleye available for anglers will be smaller. Michigan anglers will find fewer walleye from the strong 2003 year class as the summer progresses, and will rely on contributions from the moderate 2007 year class and the comparatively weak 2008 and 2009 year classes. Muskellunge and smallmouth bass numbers tend to remain more stable from year to year and both species should continue to provide excellent fishing opportunities in 2012, particularly in Lake St. Clair and the Detroit River. Still, weather conditions can affect sport fishing success as much as fish abundance. Therefore it is difficult to predict fishing success. Water levels are forecasted to remain near or below the long term average in 2012. Thus shallow waters may continue to restrict angler access to some fishing areas in the connecting waters.

Sport Fishery Summary

An on-site creel survey conducted by the Michigan Department of Natural Resources (MDNR) produced a total harvest estimate of 549,005 fish (Table 1) for Michigan's 2011 Lake Erie sport fishery (non-charter). In combination, walleye and yellow perch accounted for 94% of the total harvest, reflecting their importance in the sport fishery. Non-charter anglers caught an estimated 50,842 walleye in Michigan waters of Lake Erie, and harvested 43,795 (87%) of those fish. The low percentage of walleye released suggests that the 2009 and 2010 year classes are relatively low in abundance. Although few bass are harvested by Michigan's Lake Erie anglers, over 11,000 legal-size largemouth and smallmouth bass were reported caught and released. Estimated angler effort in 2011 declined 16% from 2010, and was the lowest recorded since the current creel survey program was initiated in 1986 (Figure 1). The walleye harvest rate in 2011 increased 9% from 2010, but remained well below the long-term mean of 0.23 walleye per angler hour (Figure 2). The yellow perch harvest rate increased by 89% in 2011, the highest harvest rate for yellow perch measured since 1986, and well above the long-term mean of 0.54 yellow perch per angler hour. Trends in angler effort and harvest rates for walleye and yellow perch since the mid-1980's

suggest that the level of angler effort on Lake Erie is affected by many factors in addition to harvest rates. Other factors, including weather, prey fish abundance, fishing success on other Great Lakes waters, and regional economic conditions have likely contributed to the comparatively low level of fishing effort since 1991. In 2011, the Bolles Harbor Boat Access Site was closed for part of the summer and fall for maintenance. This closure of one of the 2 main boat access sites for the Michigan waters of Lake Erie likely was a factor in the low angler effort recorded last year.

Biological data were collected from walleye and yellow perch during the 2011 on-site creel survey. The walleye harvest was dominated by the 2007 and 2008 year classes (ages 4 and 3), which accounted for 33% and 30% of the harvest, respectively (Figure 3). The 2003 year class (age 8) remained a strong contributor to the harvest, accounting for 15% of the total. Harvested age 8 walleye averaged 559 mm (22.0 in.) in total length. The overall average length of walleye harvested in the sport fishery in 2011 was 485 mm (19.1 in.).

Yellow perch harvest was dominated by age 3 fish (2008 year class), which accounted for 42% of the total harvest (Figure 3). Age 2 fish (2008 year class) and age 4 fish were also important in the harvest and in combination, accounted for 52% of the total harvest. Average lengths of harvested age 2, 3, and 4 yellow perch were 198 mm (7.8 in.), 221 mm (8.7 in.), and 234 mm (9.2 in.). The overall average length of yellow perch harvested in the sport fishery in 2011 was 222 mm (8.7 in.). Observed mean length at age for yellow perch taken in the Michigan sport fishery was relatively stable for age 2, 3, and 4 fish in 2011 (Figure 4).

Since 1989, Michigan charter boat operators have been required to report their charter fishing harvest and effort to the MDNR. In 2011, Michigan charter boat anglers harvested 22,967 fish from Lake Erie (Table 2). In combination, walleye (40%) and yellow perch (57%) accounted for 97% of the total harvest by number. The walleye harvest rate in 2011 was nearly unchanged from 2009 and remained below the long-term mean harvest rate of 0.73 walleye per hour for the 4th consecutive year (Figure 5). Yellow perch harvest rate decreased by 20% from 2010, but remained well above the long-term mean of 0.58 yellow perch per hour. The charter boat walleye harvest rate (0.56) was about 4.3 times higher than those estimated for non-charter anglers (0.13) in 2011, while the yellow perch charter harvest rate (0.78) was about 45% less than the rate for non-charter boat anglers (1.42).

Beginning in 2011, Michigan charter boat operators were also required to report catch-and-release fishing activity as well as harvest. For Lake Erie, charter operators reported releasing 4,026 fish. About 60% of the released fish were from the “other species” category, which generally is composed largely of white perch, white bass, freshwater drum, and channel catfish.

For the St. Clair-Detroit River system, charter boat anglers harvested 8,329 fish (Table 3). Yellow perch (44%), walleye (28%), and smallmouth bass (25%), made up the bulk of the harvest. In 2011, charter boat harvest rates for walleye declined by 11% from 2010 to the lowest level since 2003 (Figure 6). Yellow perch harvest rates, which had declined dramatically from 2007 to 2009, increased 13% in 2010, but remained well below the long-term mean harvest rate of 0.54 yellow perch per hour.

Charter operators on the St. Clair-Detroit River system reported releasing 15,060 fish (Table 3). Smallmouth bass (75%) and muskellunge (7%) accounted for the majority of the fish caught-and-released. For smallmouth bass, charter operators released 85% of the 13,378 smallmouth bass caught in 2011. Of the 1,079 muskellunge reported caught, only 5 were harvested, for a release rate of 99.5%.

Over the last 10 years, the walleye charter harvest rate for Lake Erie has generally been about 2 to 3 times higher than the St. Clair-Detroit River system rate. In 2011, the Lake Erie walleye charter harvest rate was 4.2 times higher than the Lake St. Clair charter harvest rate for walleye. Overall, the lower harvest rate typical for the St. Clair system is a result of lower walleye densities. Both the decline of the Thames River walleye population and lower numbers of walleye migrating from Lake Erie spawning sites through the St. Clair-Detroit River system have been contributing factors in lower walleye abundance in St. Clair-Detroit River system since 1990.

The number of reported Michigan charter excursions on Lake Erie declined by 5% in 2011, and remained well below the levels reported prior to 2004 (Figure 7). In 2011, charter boat excursions on the St. Clair-Detroit River system increased 13% from 2010. We suspect much of

the increase in reported St. Clair system charter excursions since 2010 has been the result of the new reporting requirement for catch-and-release fishing activity. For many years, much of the charter fishing activity on the St. Clair-Detroit River system has been catch-and-release oriented, and was largely unreported.

Muskellunge catch rates derived from the Sport Fishery Diary Program on Lake St. Clair improved through the late 1980's and early 1990's, but were more variable in the 2000's. In 2011, the catch rate was unchanged and remained consistent with the range observed since about 1995 (Figure 8). We suspect the increased variability in catch rates seen over the last 5 years may be more reflective of the lower number of muskellunge anglers involved in the diary program, than of actual changes in the muskellunge population.

For years, the quality of the Lake St. Clair muskellunge fishery was reflected in the MDNR's Master Angler Program. Lake St. Clair continued to dominate the statewide Master Angler entries for muskellunge in 2011, with 15 of the 33 total entries originating from the St. Clair system. However, the number of Lake St. Clair muskellunge Master Angler entries has generally declined since 2000 (Figure 9). In 2011, both the total number of Lake St. Clair muskellunge Master Angler entries as well as entries for fish weighing over 30 pounds (or 50" in length) were the lowest observed since 1991. We suspect this is largely a reflection of waning interest in submitting Master Angler entries for muskellunge less than 50" in length, which has become a local benchmark for "trophy" status for muskellunge from the St. Clair-Detroit River system. By all accounts, the muskellunge population continues to provide excellent fishing opportunities. We expect that the following factors will continue to contribute to a strong muskellunge population and fishery in Lake St. Clair and the connecting waters: 1) a 44" minimum size limit (MSL) for Ontario waters and a 42" MSL for Michigan waters of the St. Clair system; 2) physical and biological changes in the lake such as clearer water and increased aquatic plant growth resulting in improved habitat for muskellunge; and, 3) extensive voluntary practice of catch and release fishing for muskellunge in Lake St. Clair by both sport and charter anglers.

Statistics from the Master Angler program also indicate that Lake St. Clair is one of the premier waterbodies in the state for trophy smallmouth bass. Lake St. Clair accounted for 34% of all smallmouth bass entries statewide in 2011 (catch/keep and catch/release programs combined). Since the early 1990's, both catch/keep and catch/release Master Angler smallmouth bass entries from Lake St. Clair have exhibited an increasing trend (Figure 10). Catch/release entries have outnumbered catch/keep entries for the last 12 years. The strong representation of Lake St. Clair smallmouth bass in the statewide Master Angler Program is likely a reflection of an abundance of trophy-size smallmouth bass in the lake, a high degree of angler effort targeting the species, and widespread practice of catch-and-release among smallmouth bass anglers.

Commercial Fishery Summary

In 2011, three Michigan commercial fishing licenses were active on Lake Erie. Since 1979, the commercial fishery in Michigan waters of Lake Erie has harvested rough fish species using seines in the shallow embayments along the shoreline. However, since 2006 a small-mesh trap net license has been active. The 2011 commercial harvest included 12 types of fish for a total of 1,202,908 pounds (Table 4). In combination, common carp (33%), freshwater drum (19%), and channel catfish (12%) accounted for 64% of the total harvest by weight. The major species in the trap net harvest included freshwater drum, quillback, and channel catfish. The primary species in the seine harvest included common carp, freshwater drum, and channel catfish. The 2011 harvest of freshwater drum, channel catfish, bullhead, and sucker was the highest reported since 1981 (Table 4). The harvest of goldfish and quillback in 2011 was also near record harvests observed for those species since 1981. The total value of the 2011 Lake Erie commercial harvest from Michigan waters was estimated at $438,982 (Table 5).

Summary of Netting Surveys

Since 1978, the MDNR has fished variable mesh multi-filament gill nets at two locations in western Lake Erie each fall, as part of the interagency walleye assessment program. During October 2011, four net lifts caught a total of 166 walleye. The total walleye catch-per-effort (CPE) for the index sites (41.5) increased by 24% from 2010 (Table 6). Yearling walleye (2010 year class) accounted for 58% of the catch, with the yearling walleye CPE of 24.0 similar to the CPE recorded for the 1998 year class. The 2009 year class was

the 2nd most abundant cohort in the survey, accounting for 17% of the catch. Combined, the 2009 and 2010 year classes will be the largest component of the Michigan Lake Erie walleye fishery in 2012. However, many of the 2010 year class fish may be sub-legal size with the 15 inch MSL for Michigan waters.

In 2011, the MDNR surveyed adult fish populations in Anchor Bay, Lake St. Clair with trap nets. Four trap nets were fished from May 3 to May 24 at the index net sites. A total of 7,897 fish representing 26 species were captured during the survey. Rock bass were numerically dominant, accounting for 69% of the total (Figure 11). Other common species in the nets included smallmouth bass (11%), walleye (3%), and channel catfish (3%). The trap net catch included four wild hybrid muskellunge x northern pike, commonly referred to as tiger muskellunge.

Ages were estimated for walleye (n=262) and smallmouth bass (n=852) based on interpretation of dorsal spine samples. The dominant walleye year class was the 2009 year class (Age 2), accounting for 24% of the total catch (Figure 12). The 2007 year class (Age 4) was also a major component of the walleye catch, accounting for 21% of the total. For smallmouth bass, the 2005 (23%), 2006 (22%) and 2007 (19%) year classes accounted for 64% of the total trap net catch. A total of 803 smallmouth bass were tagged and released at the Anchor Bay trap net site in 2011.

Ages were estimated for northern pike (n=135) and muskellunge (n=14) caught in the Anchor Bay index trap nets, based on interpretation of dorsal fin ray sections (Figure 13). For northern pike, 92% of the fish were 6 years old or younger. In contrast, for muskellunge, 43% of the fish were 8 years old or older. The oldest muskellunge sampled in 2011 was 12 years old.

The trap net survey revealed an abundant population of channel catfish in Anchor Bay with many trophy size individuals. The average weight of channel catfish captured during the 2011 trap net survey was 5.8 pounds. Over 20% of the channel catfish exceeded the minimum size requirement (27 inches total length) for the MDNR Master Angler program. Anglers are discouraged from keeping large channel catfish for food due to consumption advisories as a result of PCB contamination. However, catch-and-release trophy channel catfish angling opportunities are clearly available in Anchor Bay during the spring. The high abundance of large channel catfish suggests that this population is currently experiencing low exploitation.

Over the 10 years of the trap net survey in Anchor Bay since 2002, rock bass have dominated the catch (Table 7). Smallmouth bass CPE has varied considerably, while walleye CPE has been fairly steady. We suspect smallmouth bass catch rates in the trap nets are related to spawning movements during the survey period and are likely affected by annual variations in the warming of the waters of Anchor Bay. Sturgeon catch rates are low, but a few are captured in the trap nets each year.

The forage fish community of Lake St. Clair has been surveyed with bottom trawls each year since 1996 by the MDNR. A total of 8 trawl tows were conducted at the Anchor Bay index trawling site in 2011. The spring samples were dominated by spottail shiner and yellow perch (Table 8). The species with highest mean densities in the fall samples were spottail shiner, sand shiner, and bluntnose minnow (Table 9). Alewife catches have been low since 2003, likely a result of the alewife population crash in Lake Huron. Yellow perch age-specific catch rates from the trawl survey indicate highly variable recruitment in Lake St. Clair (Table 10). Yellow perch recruitment in 1998, 2003, 2007, and 2008 was strong, with total CPE values for those year classes all over 1,300 fish. Anglers will find the strength of the 2007 and 2008 year classes clearly illustrated by the number of yellow perch in the 6 to 9 inch size range in 2012.

September trawling in Anchor Bay provides early indications of spawning success for yellow perch and smallmouth bass. Catch rates for young-of-year yellow perch from September trawls indicate the 2011 year class was very low in abundance (Figure 14). However, the 2010 year class was the most abundant year class recorded since the survey began in 1996. In combination with the strong 2007 and 2008 year classes, the 2010 year class will result in continued strong contributions of yellow perch to the Lake St. Clair fishery over the next 5 years.

Smallmouth bass recruitment patterns are variable based on September trawl catch rates of young-of-year (Figure 15). The 2011 year class densities were below average, and much less abundant than the record high densities recorded for the 2010 year class the previous September. Population studies have suggested that mean

length of young-of-year smallmouth bass in the fall can be more important than abundance in determining year class strength. Young-of-year smallmouth bass caught in 2011 had the third highest mean length observed during the study, suggesting the 2011 year class could be a contributor to the smallmouth bass fishery in the future.

A total of 202 lake sturgeon were collected during assessment surveys on Lake St. Clair and the St. Clair River in 2011. Sturgeon captured averaged 1,130 mm (44.5 in.) in total length, with a range from 533 mm (21.0 in.) to 1,702 mm (67.0 in.) Since 1997, pectoral fin ray sections have been used to estimate the ages for 2,349 lake sturgeon captured in MDNR assessment surveys in Lake St. Clair and the St. Clair River. Recent examination of pectoral fin rays collected from individual lake sturgeon recaptured after 6 or more years-at-large suggests that age estimates from lake sturgeon over 40 inches in total length may be unreliable. Therefore, we have elected to use ages from lake sturgeon under 40 inches total length to evaluate yearclass strength. Combined age samples for sub-40 inch lake sturgeon from 1997-2011 suggest recruitment has been fairly stable since the early 90's with strongest cohorts produced in 1993, 2000, 2001, and 2003 (Figure 16). However, survey setlines were modified in 2003 to include small hooks, providing a less biased sample of the sturgeon population.

Fish Tagging Studies

In 2011, Michigan tagged a total of 803 smallmouth bass with non-reward jaw tags in Anchor Bay of Lake St. Clair. Walleye captured during the spring trap net survey were not tagged. A total of 61 non-reward tags placed on smallmouth bass in 2011 were recovered by fisherman for a single season reporting rate of 7.6%, more than double the reporting rate of 3.1% observed in 2010. Eleven walleyes that were tagged in previous years were reported in 2011.

Since 2002, a total of 1,349 legal size walleye and 3,958 smallmouth bass captured in survey trap nets in Anchor Bay have been tagged and released. Maps showing the geographical distribution of walleye and smallmouth bass tag recoveries since 2003 for fish tagged in Anchor Bay through 2011 are presented in Figure 17. The migratory nature of walleye is illustrated by the wide dispersal of tag recoveries from Anchor Bay, with recoveries northward to Port Huron, and southward as far as the Bass Islands in Ohio waters of Lake Erie. In comparison, smallmouth bass movements are rather localized, with nearly all the smallmouth bass recoveries reported from the Michigan waters of Lake St. Clair. The northernmost smallmouth bass tag recovery has been from the Marine City area of the St. Clair River, and the southernmost recovery came from the Detroit River near the Ambassador Bridge. On average, recaptured walleyes tagged during 2002-2010 had traveled 26.7 km from the Anchor Bay tag site, while smallmouth bass tagged during 2002-2011 had traveled 8.4 km. Walleye tagged at the Anchor Bay site are not typically recovered on known spawning grounds in subsequent years, so their natal spawning site is still a matter of conjecture. We continue to think that the individual walleye tagged in Anchor Bay originate from Lake Erie spawning stocks and that they repeat individual movement patterns from year to year.

One smallmouth bass tagged in Anchor Bay was recovered from Whitmore Lake in Washtenaw County (Figure 17). As there is no connection between the two water bodies this fish was illegally transported from Lake St. Clair to Whitmore Lake and released, where it was subsequently recaptured and reported. Anglers are reminded that the unauthorized transfer of fish from one water body to another poses significant risks, particularly for introduction of diseases such as viral hemorrhagic septicemia (VHS; the illness responsible for large fish die-offs in the Great Lakes region during the early 2000s).

Walleye tagging by Michigan in Lake Erie was put on indefinite hold in 2011. The distribution of tag recoveries to date from walleye tagged in the Huron River at Flat Rock prior to 2011 show that these fish tend to be captured along the south and western shores of Lake Erie, in the Detroit and St. Clair rivers, and on Michigan's side of Lake St. Clair (Figure 18). Recoveries of tagged Lake Erie walleye continue to provide evidence of substantial movement from spawning locations in Lake Erie through the St. Clair connecting waters. However, it is obvious from tag recovery patterns that some individuals from the Lake Erie spawning stocks migrate within that lake, never venturing into the Detroit River and Lake St. Clair.

A total of 2,437 lake sturgeon have been tagged and released on the St. Clair River and Lake St. Clair since 1996. To date, 367 tagged lake sturgeon have been recaptured with survey gear

or reported by fishermen. A total of 237 tagged sturgeon have been recovered with survey setlines in the North Channel. One was recovered in survey trap nets in Anchor Bay, while 11 have been recaptured in assessment trawls on Lake St. Clair. Sport anglers have reported 86 recoveries, nearly all from the St. Clair River North Channel, except for one reported from Lake Erie, near Huron, Ohio. Twenty-one recoveries have been reported from the Ontario commercial trap net fishery in southern Lake Huron, approximately 70 km from the tag site. All other recaptures have occurred within 10 km of the tag sites. Trawling has accounted for the capture of 38% of the sturgeon tagged and released during this study, but only 28 recoveries (8%) have been fish originally caught in a trawl on Lake St. Clair. This may be an indication that fish residing year-around in the St. Clair River, or moving into Lake Huron, experience a higher level of exploitation than fish residing all year in Lake St. Clair.

Water Levels

Since 2001, anglers and boaters have experienced below or near-average water levels in the connecting waters and Lake Erie. Water levels in the connecting waters are expected to be below or near the long-term average again in 2012. The effect of lower water levels on fish populations remains unclear. For example, northern pike spawning may be negatively impacted because coastal wetlands are dewatered. Alternatively, surveys suggest that largemouth bass spawning has improved in the shallower conditions present in the canals and marshes around Lake St. Clair since 2000. In Lake St. Clair, recovery of beds of emergent bulrush and wild rice has been apparent over the past several years. Unfortunately, invasive common reed (*Phragmites australis)* has also expanded its distribution in the St. Clair Flats area during this period of low water. When above average water levels return, increased coastal wetland habitat is expected to positively impact many of the fish species in the connecting waters.

Sport Fishing Regulations

Walleye in Lake Erie are managed cooperatively with other jurisdictions under a harvest quota system. Beginning in 2011, the walleye daily bag limit for anglers in Michigan waters of Lake Erie will be directly related to the Total Allowable Catch (TAC) for walleye determined by the Great Lakes Fishery Commission Lake Erie Committee (LEC) in late March. The table below provides the quota thresholds used to determine the daily bag limit under this new regulation. The walleye daily bag limit regulation will be effective from May 1 through the end of April in the following year. For 2011, the LEC agreed upon a TAC of 2.9 million walleye, with a Michigan quota of 170,000 walleye. This quota sets the Michigan walleye daily bag limit at 6 fish from May 1, 2011 to April 30, 2012. The 2012 daily bag limit for walleye fishing in Michigan waters of Lake Erie will be announced in April. The Michigan walleye minimum size limit (15 inches) and season (open all year) for Lake Erie waters remain unchanged for 2012.

MI walleye quota	Daily bag limit
more than 108,364 fish	6
96,958 to 108,364 fish	5
85,551 to 96,957 fish	4
74,144 to 85,550 fish	3
62,737 to 74,143 fish	2
less than 62,737 fish	1

In 2006, Michigan bass fishing seasons were changed to include a statewide early catch-and-immediate-release (CIR) season. The CIR season opens statewide the last Saturday in April (April 28, 2012) and extends to the opening day for the harvest season. The harvest season for smallmouth and largemouth bass fishing in the Michigan portion of the connecting waters is the third Saturday in June (June 16, 2012) to December 31. The harvest season for the Michigan waters of Lake Erie opens on the Saturday before Memorial Day (May 26 in 2012).

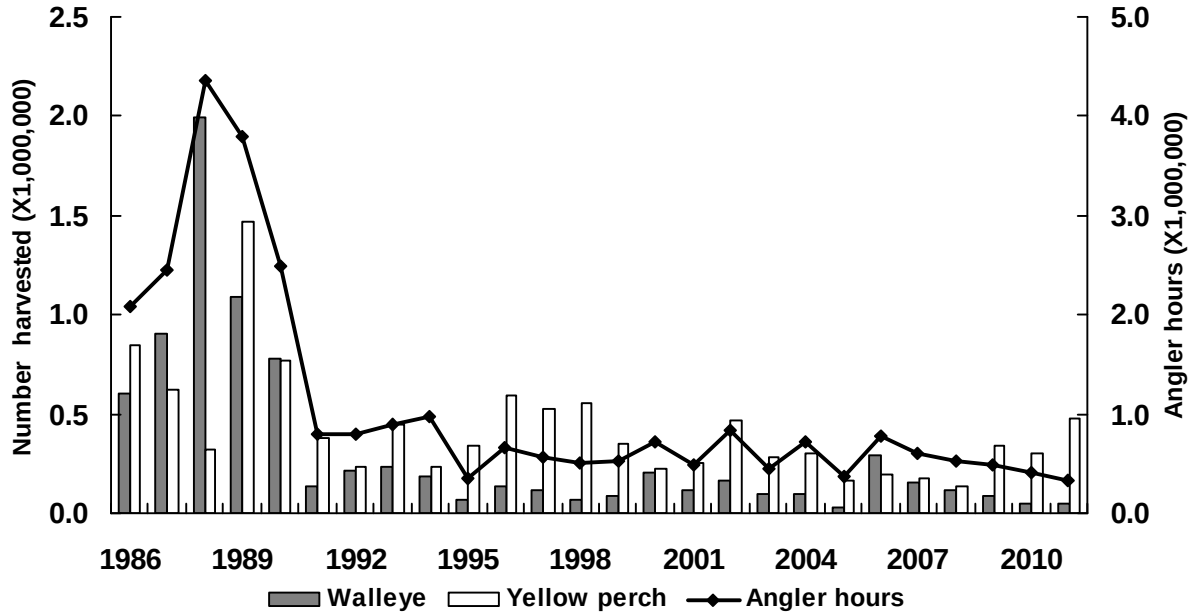

Figure 1.—Estimated harvest and effort for Michigan's Lake Erie sport fishery, 1986-2011.

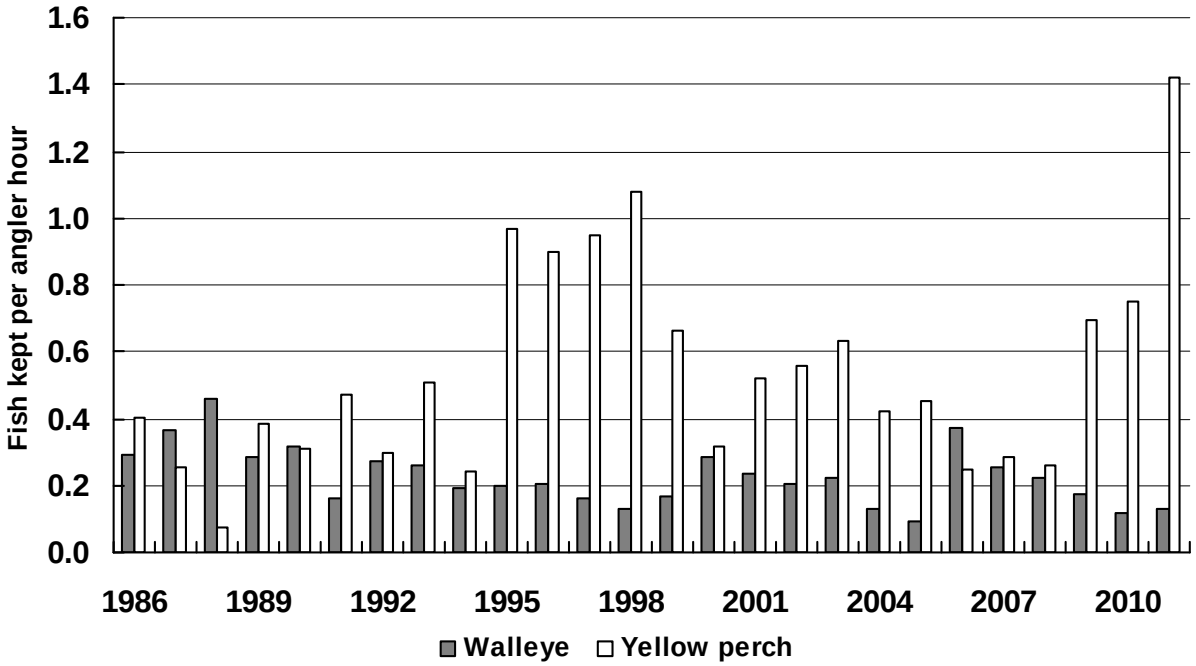

Figure 2.—Walleye and yellow perch harvest rates for Michigan's Lake Erie sport fishery, 1986-2011.

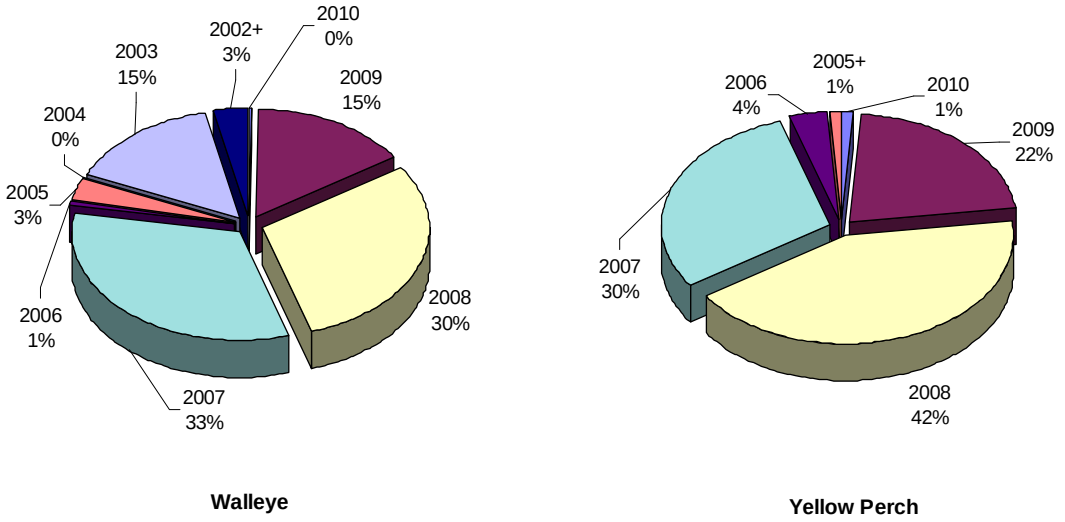

Figure 3.—Year class contribution to Michigan sport harvest for walleye and yellow perch from Lake Erie in 2011.

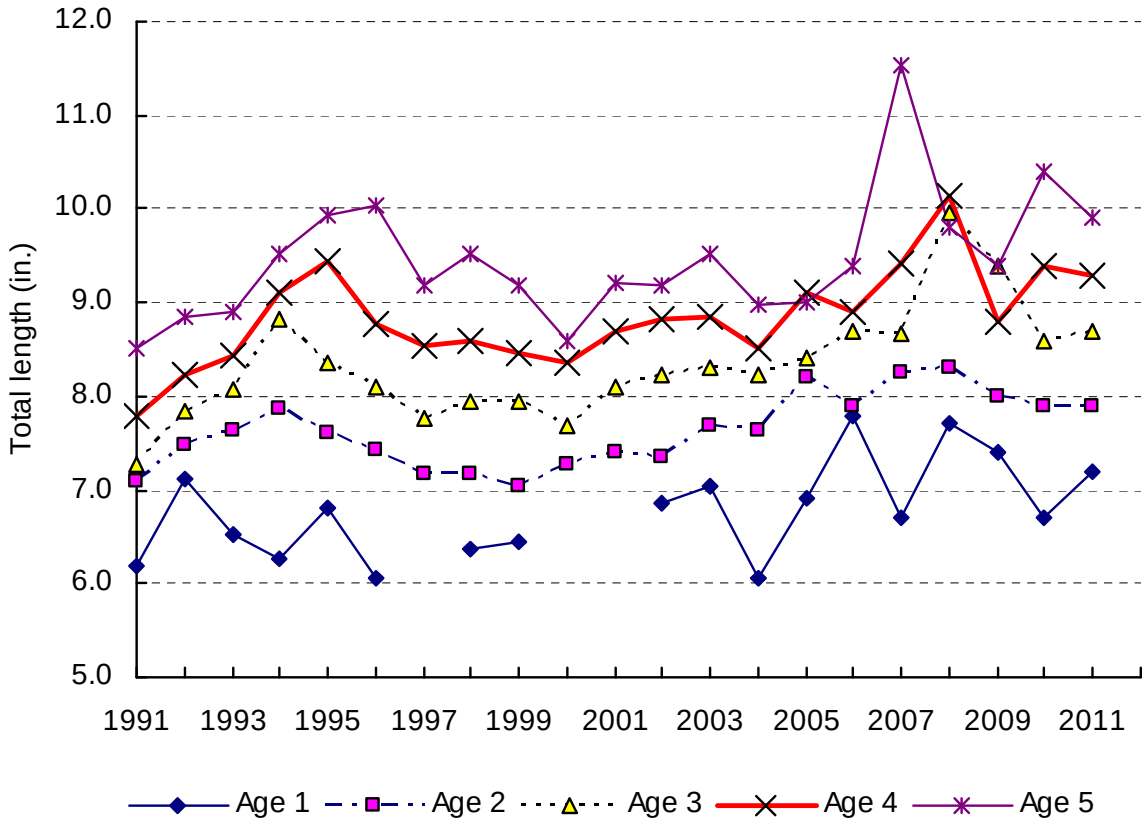

Figure 4.—Mean length at age for sport-harvested yellow perch from Michigan's waters of Lake Erie, 1991-2011.

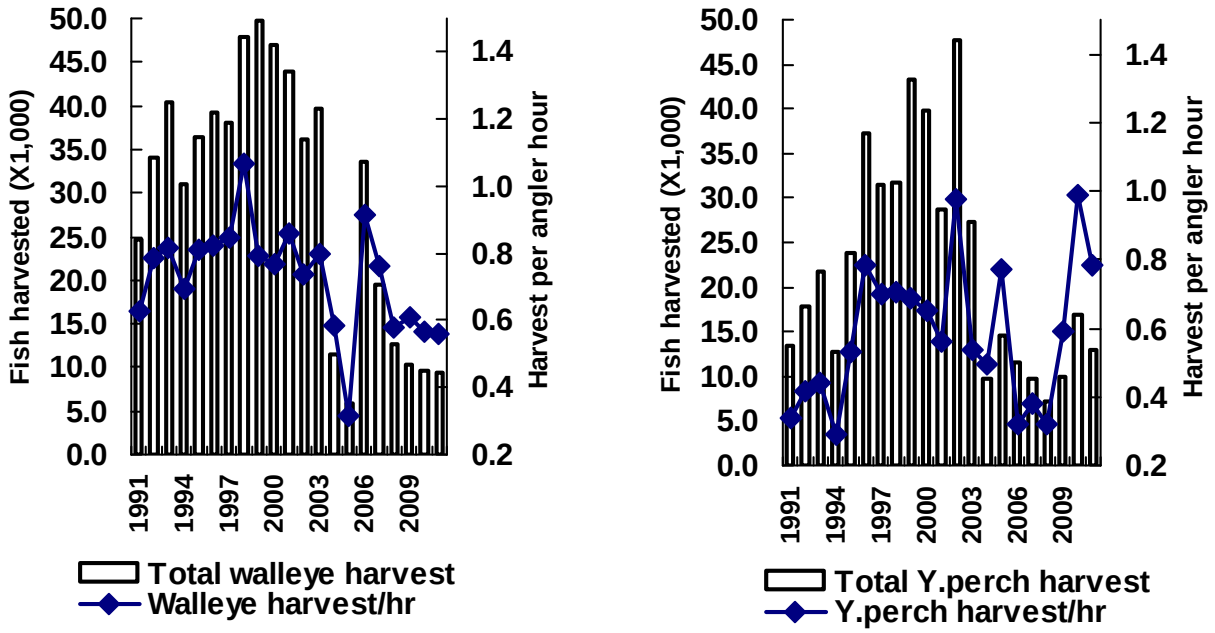

Figure 5.—Michigan charter boat harvest and harvest rates for Lake Erie, 1991-2011.

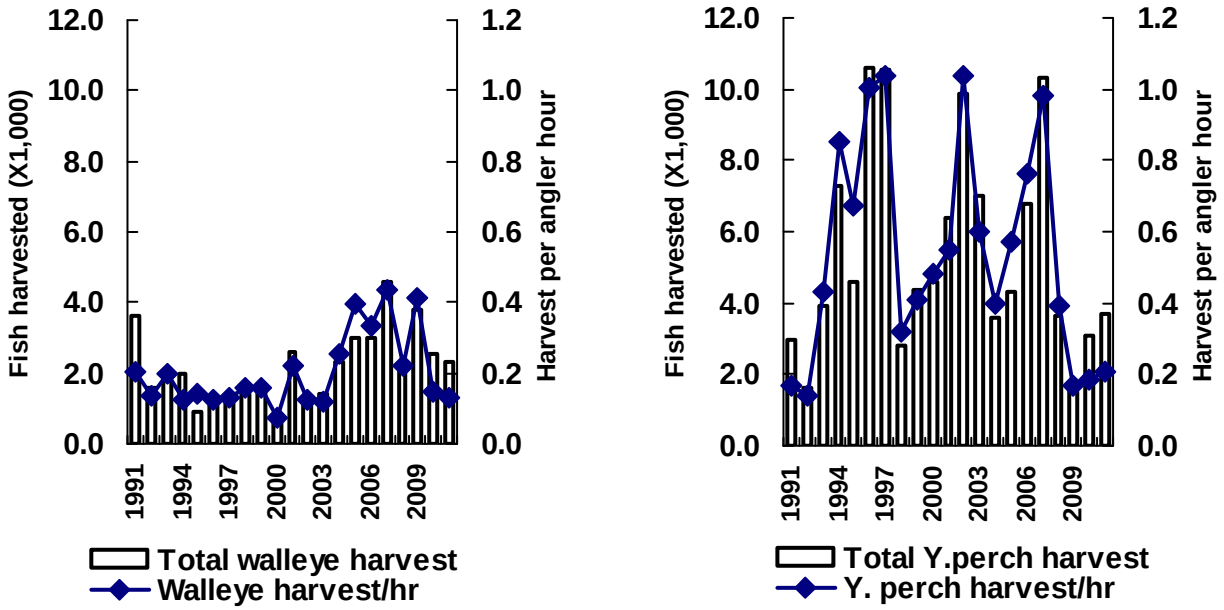

Figure 6.—Michigan charter boat harvest and harvest rates for the St. Clair-Detroit River system, 1991-2011.

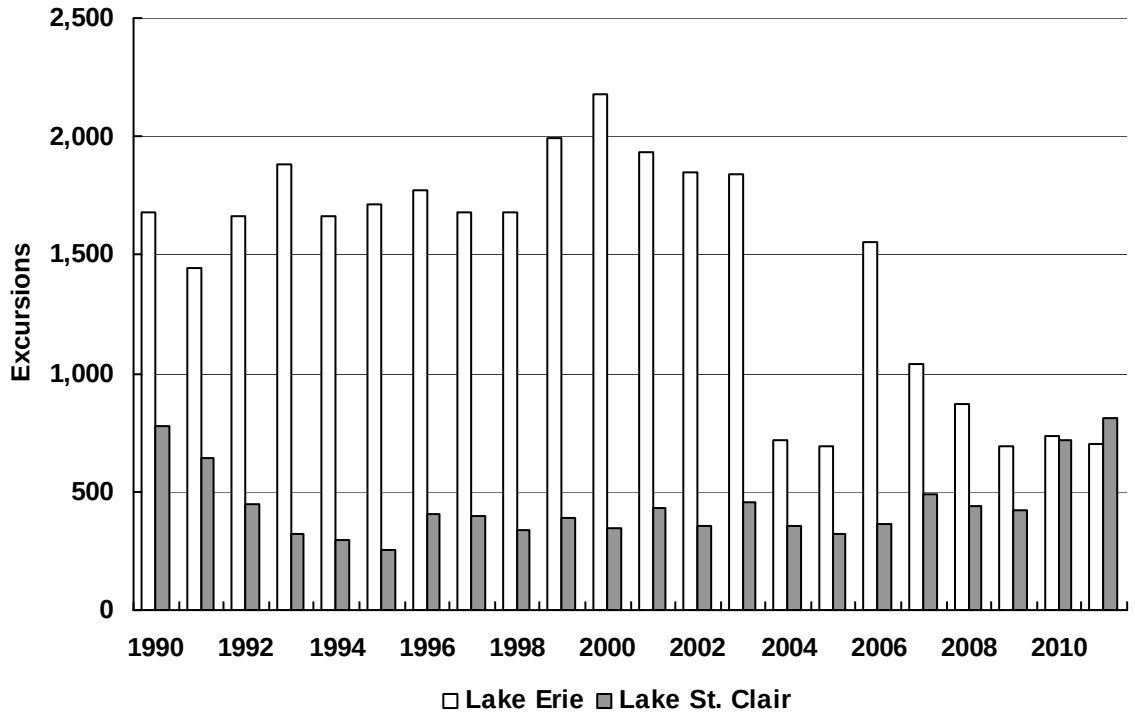

Figure 7.—Reported charter boat excursions on Lake Erie and the St. Clair-Detroit River system, 1990-2011.

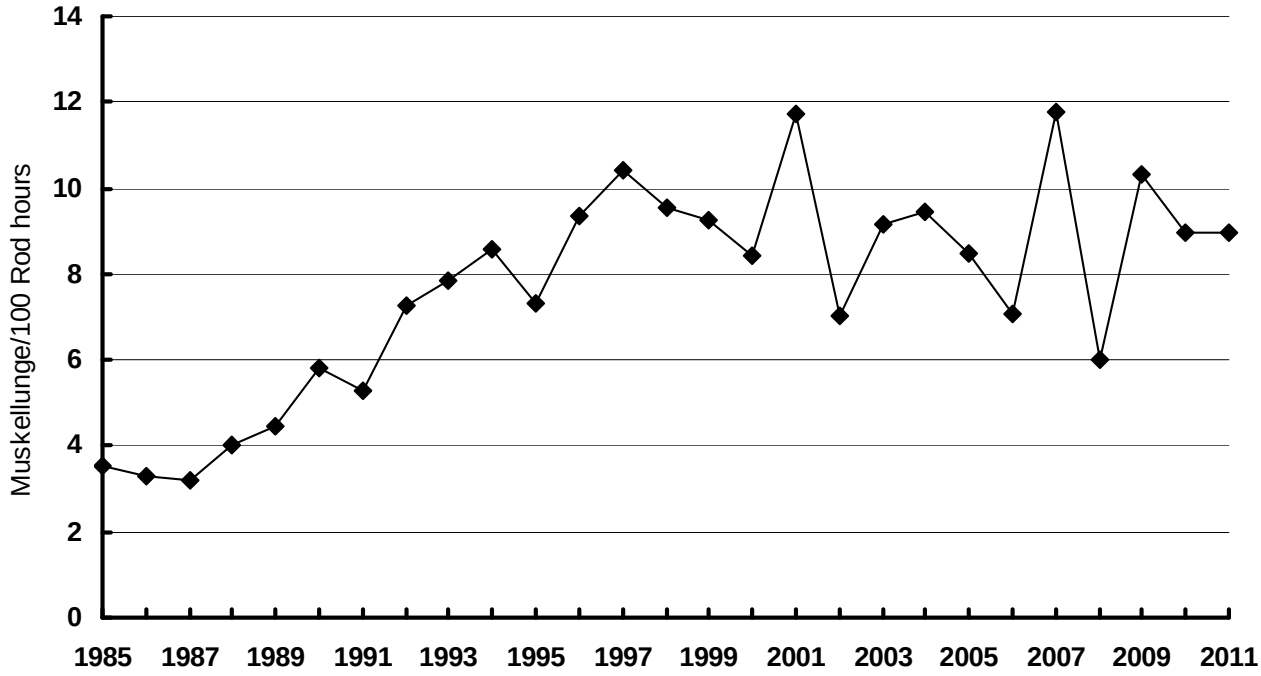

Figure 8.—Lake St. Clair muskellunge catch rate from Angler Diary Program, 1985-2011.

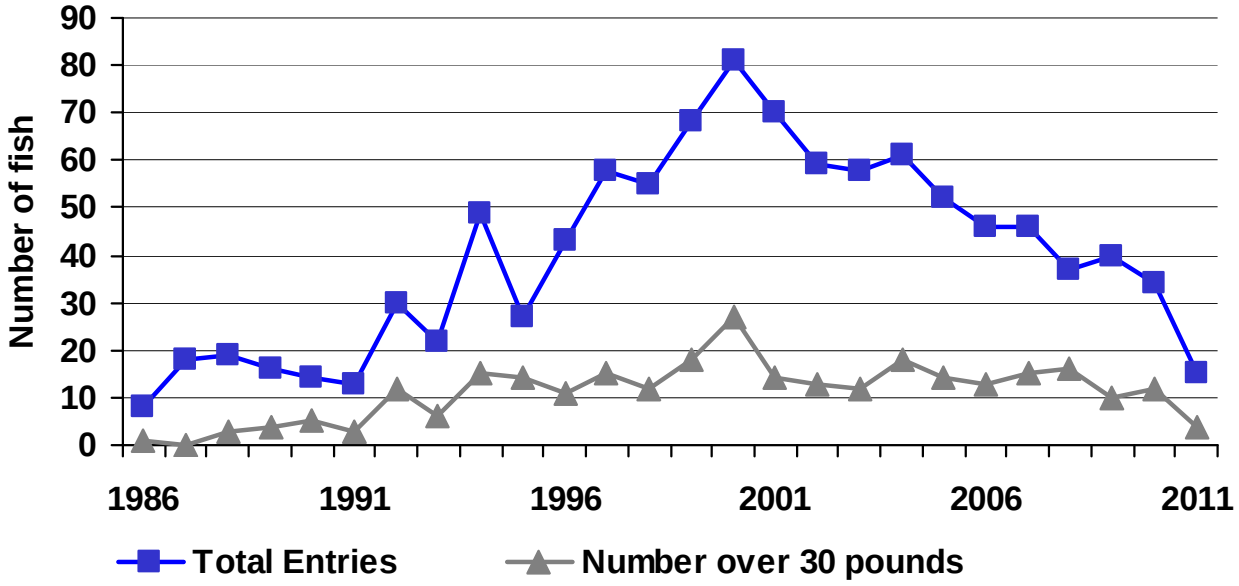

Figure 9.—Lake St. Clair muskellunge entered in the Michigan DNR Master Angler Program, 1986-2011. Values for 1992-2011 represent combined regular and catch-and-release Master Angler categories.

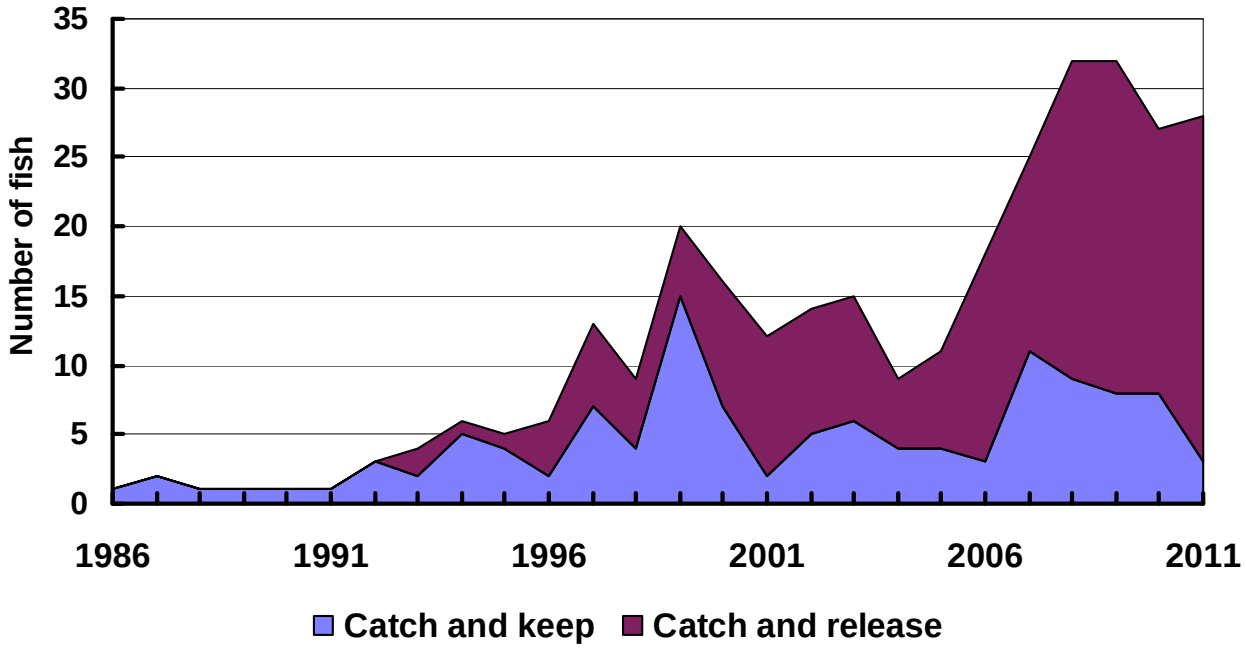

Figure 10.—Lake St. Clair smallmouth bass entered in the Michigan DNR Master Angler Program, 1986-2011.

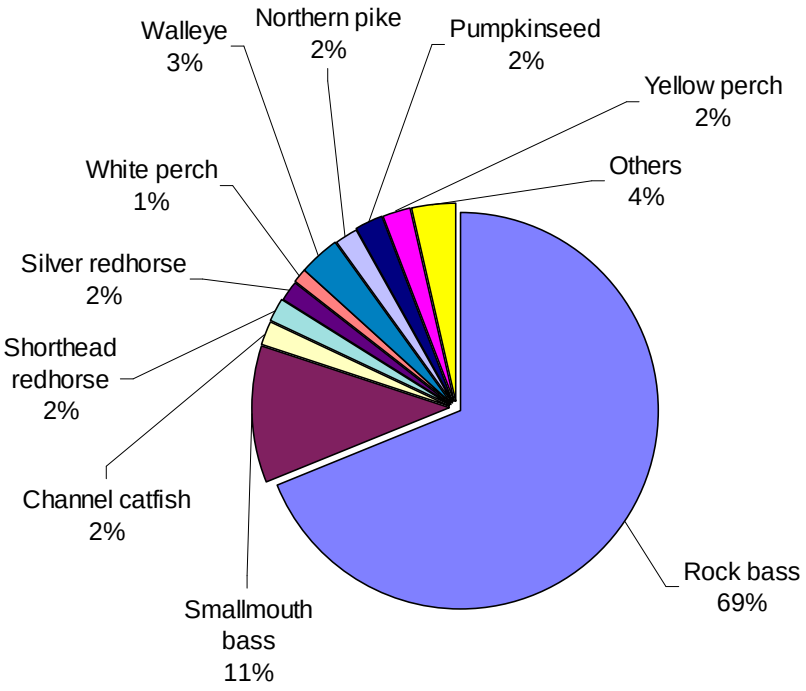

Figure 11.—Catch composition for trap nets fished in Lake St. Clair during May 2011.

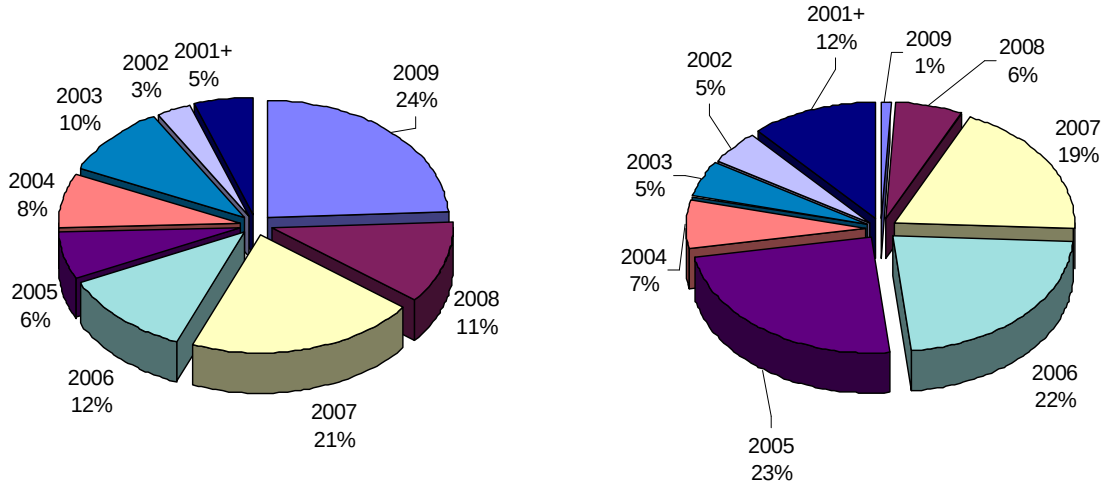

Figure 12.—Contribution by year class to catch in survey trap nets in Lake St. Clair during May 2011.

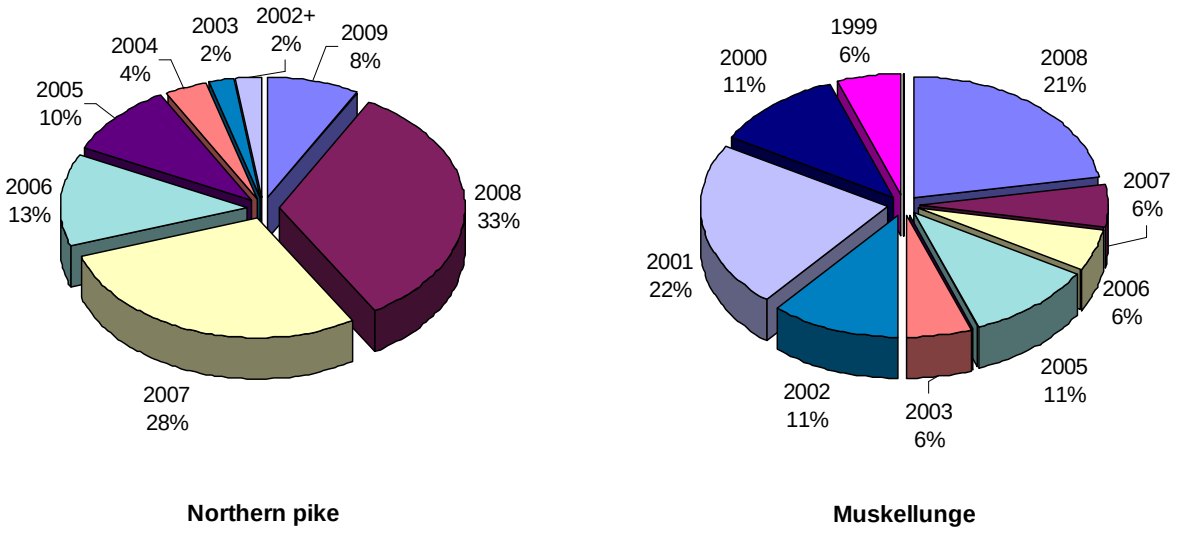

Figure 13.—Contribution by year class to catch in survey trap nets in Lake St. Clair during May 2011.

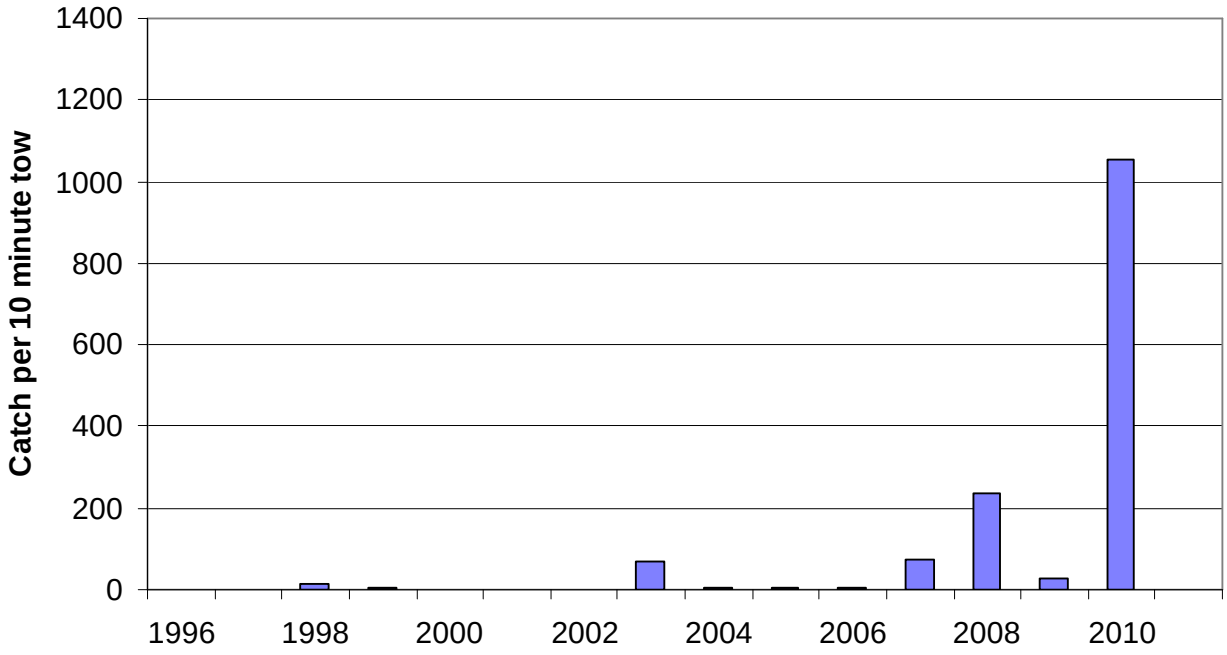

Figure 14.—Year-class strength for yellow perch in Lake St. Clair as indicated by September trawl age 0 catch rates, 1996 to 2011.

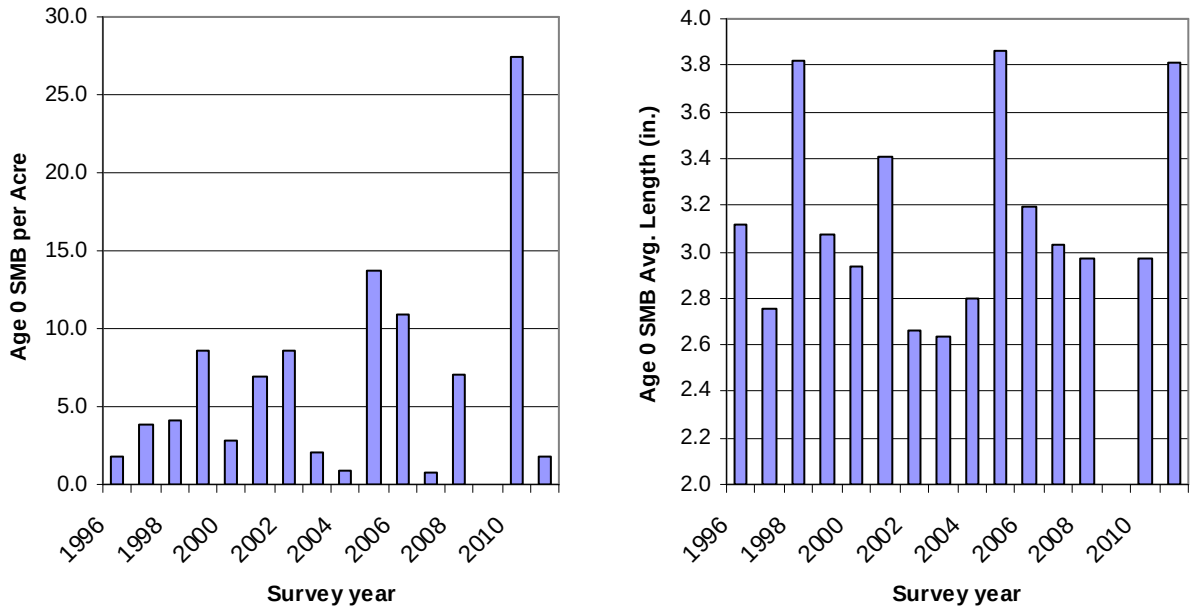

Figure 15.—Year-class strength for Lake St. Clair smallmouth bass as indicated by September trawl catch rates and mean length for young-of-year, 1996 to 2011.

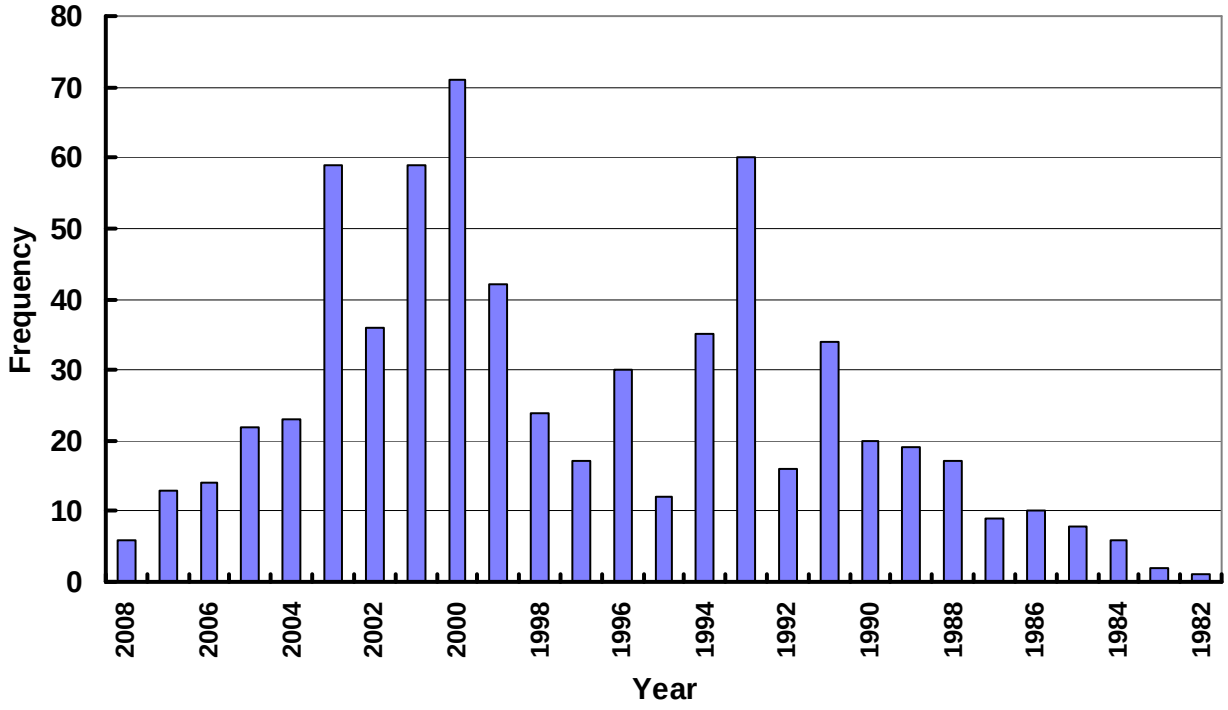

Figure 16.—Hatch year for lake sturgeon (sub-adults >40 in. TL) sampled from Lake St. Clair and St. Clair River from 1997 to 2011 by Lake St. Clair Fisheries Research Station (n=665) based on pectoral fin ray ages.

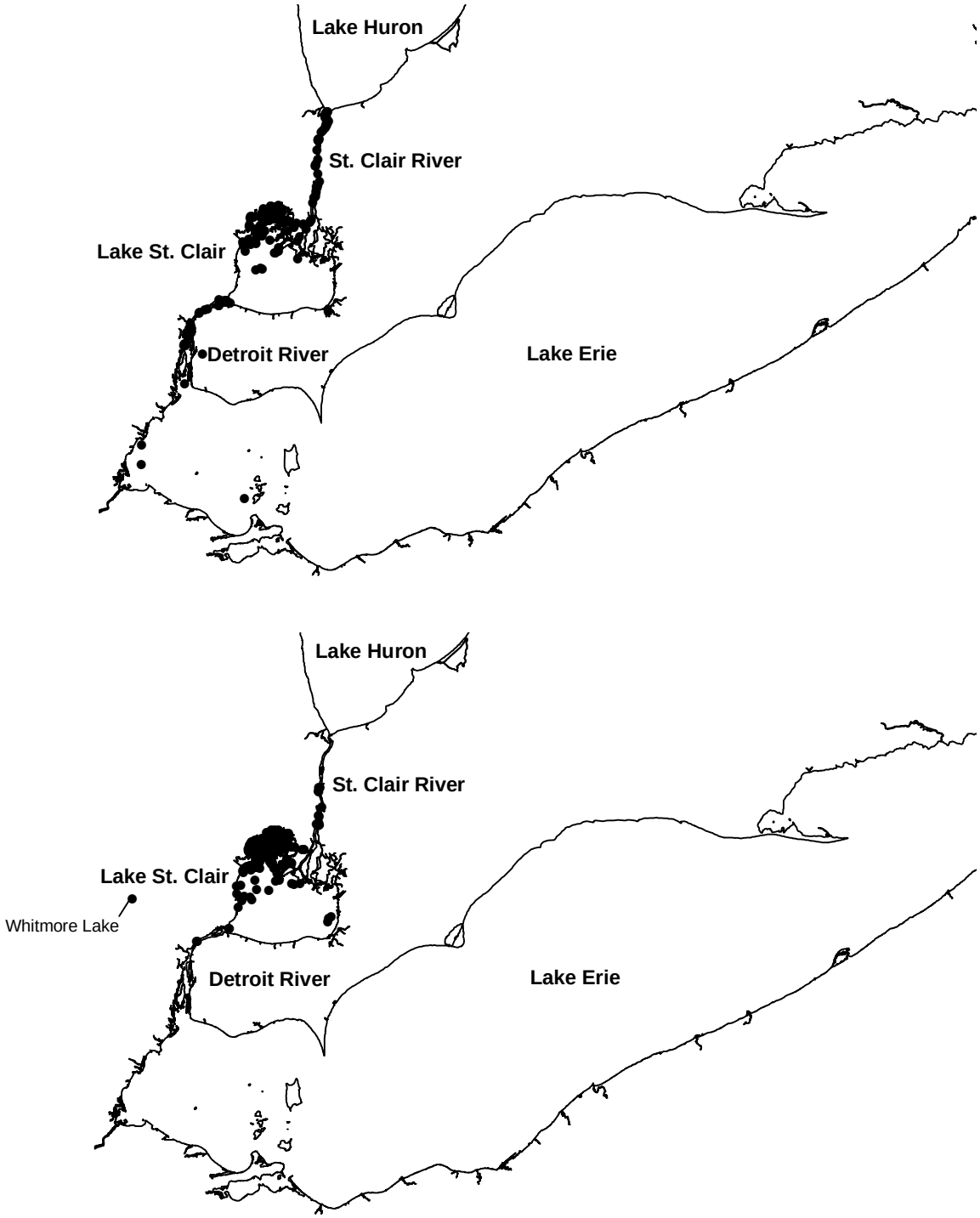

Figure 17.— Geographical distribution of walleye tag recoveries (N=161, top map) and smallmouth bass tag recoveries (N=305, bottom map) for fish tagged during 2002-2011 at the Anchor Bay site in Lake St. Clair. Black dots represent the recovery location of individual fish.

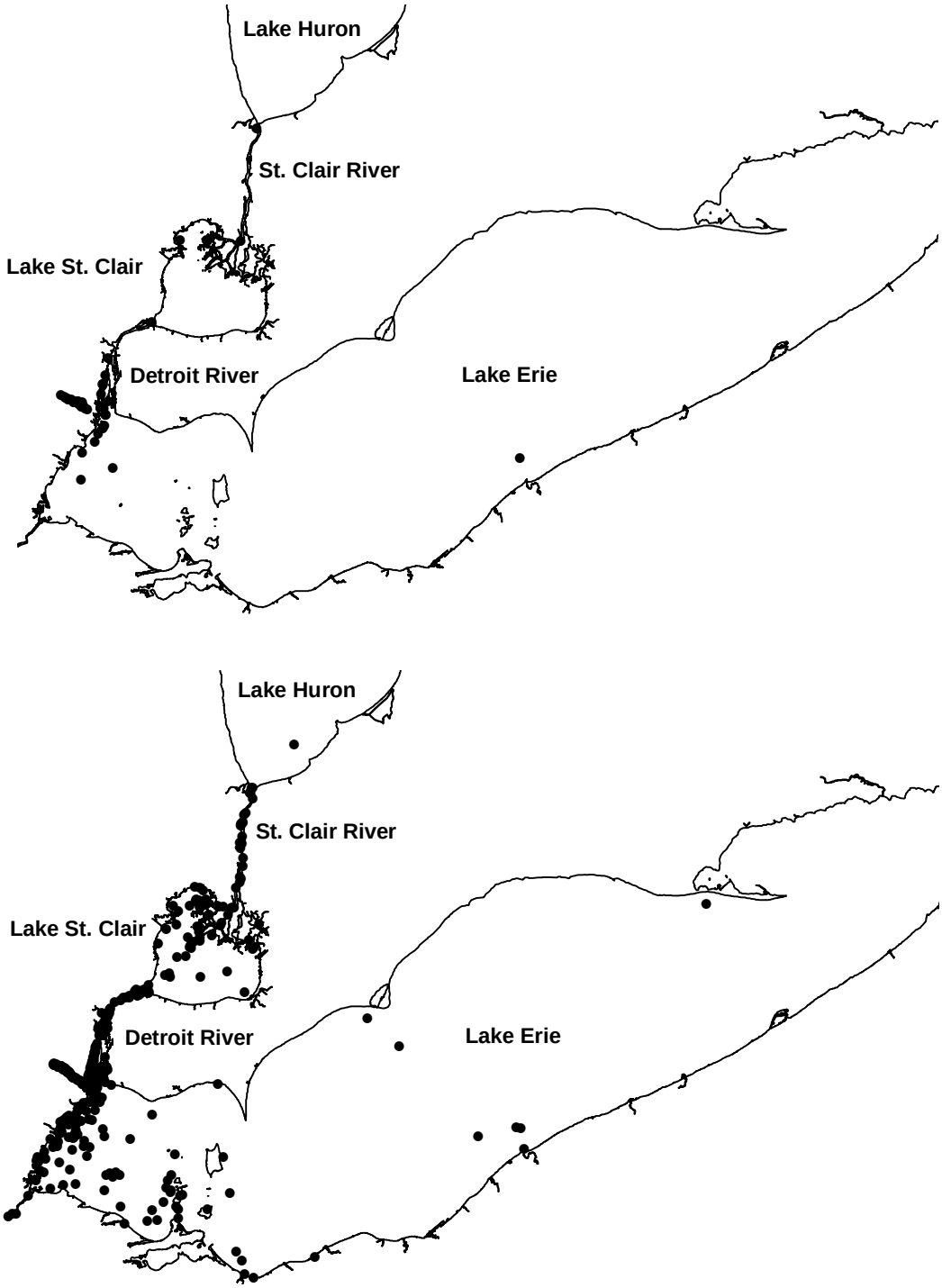

Figure 18.— Geographical distribution of walleye tag recoveries in 2011 from fish tagged during 1994-2010 in the Huron River at Flat Rock, MI (N=41, top map) and for all tag recoveries since 2003 for fish tagged during 1994-2010 in the Huron River (N=447, bottom map). Black dots represent the recovery location of individual fish.

Table 1.—Estimated harvest, harvest rate, effort, and released catch for Michigan's 2011 Lake Erie non-charter boat fishery. Two standard errors in parentheses.

Species	Harvest rate	Month Apr	May	Jun	Jul	Aug	Sep	Oct	Season
HARVEST									
Yellow perch	1.4187	0	1,024	52,693	169,804	95,597	86,129	69,340	474,586
	(0.3451)								(92,312)
Walleye	0.1309	401	1,779	19,934	18,886	2,663	50	82	43,795
	(0.0373)								(10,712)
White perch	0.0040	0	0	416	793	131	4	7	1,350
	(0.0039)								(1,299)
Channel catfish	0.0476	42	277	2,465	7,135	4,304	512	1,175	15,909
	(0.0239)								(7,658)
White bass	0.0298	14	0	1,459	2,657	5,595	173	87	9,985
	(0.0108)								(3,293)
Freshwater drum	0.0054	0	290	559	434	448	52	29	1,814
	(0.0030)								(963)
Bluegill	0.0027	0	0	0	0	913	0	0	913
	(0.0056)								(1,875)
Largemouth bass	0.0005	0	0	0	76	0	11	72	159
	(0.0004)								(145)
Smallmouth bass	0.0015	0	0	0	232	137	92	34	495
	(0.0011)								(345)
Total Harvest	1.6411	457	3,369	77,526	200,016	109,788	87,023	70,827	549,005
	(0.0339)								(93,341)
EFFORT									
Angler hours		7,315	28,534	82,031	121,394	54,428	18,537	22,291	334,531
									(48,855)
Angler trips		1,536	5,627	16,172	24,621	12,489	4,380	4,719	69,545
									(9,937)
RELEASED									
Walleye Legal size	0.0020	112	76	354	87	31	13	5	679
	(0.0011)								(359)
Walleye Sub-legal	0.0190	0	0	1,855	3,795	613	43	62	6,368
	(0.0063)								(1,891)
Largemouth Bass	0.0233	69	900	1,112	2,924	342	540	1,913	7,800
	(0.0195)								(6,411)
Smallmouth bass	0.0122	29	1,031	203	1,266	655	427	474	4,086
	(0.0056)								(1,787)
White bass	0.3075	14	8,480	17,811	45,581	22,813	5,805	2,357	102,860
	(0.0862)								(24,616)

Table 2.—Total harvest per hour, harvest per excursion, number harvested, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Erie, 2011.

Species	Total catch per hour	Catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct[1]	
Harvested										
Chinook salmon	0.0002	0.0043	0	0	3	0	0	0	0	3
Rainbow trout	0.0002	0.0043	0	0	3	0	0	0	0	3
Yellow perch	0.7843	18.6762	0	837	799	2,315	3,285	4,252	1,548	13,036
Walleye	0.5602	13.3395	267	985	5,397	2,382	267	13	0	9,311
Small. bass	0.0006	0.0143	0	3	5	2	0	0	0	10
Muskellunge	0.0000	0.0000	0	0	0	0	0	0	0	0
Other	0.0363	0.8653	0	103	421	50	20	10	0	604
Released										
Rainbow trout	0.0002	0.0057	0	0	4	0	0	0	0	4
Yellow perch	0.0323	0.7693	0	80	35	75	41	177	129	537
Walleye	0.0649	1.5444	7	177	635	240	19	0	0	1,078
Small. bass	0.0028	0.0673	3	19	13	7	0	0	5	47
Muskellunge	0.0001	0.0014	0	0	1	0	0	0	0	1
Other	0.1419	3.3797	0	319	1,031	360	377	212	60	2,359
Angler hours			554	1,794	8,242	3,551	1,160	1,017	304	16,622
Angler trips			97	335	1,562	665	218	178	58	3,113
Charter excursions			26	86	338	148	48	38	14	698

[1]October and November values combined.

Table 3.—Total harvest per hour, harvest per excursion, number harvested, and fishing effort (angler hours, trips, and charter excursions) for charter boats on the Detroit River, Lake St. Clair, and the St. Clair River, 2011.

Species	Total catch per hour	Catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct[1]	
Harvested										
Yellow perch	0.2064	4.5209	0	0	1,301	1,175	162	609	433	3,680
Walleye	0.1316	2.8833	604	808	188	357	197	95	98	2,347
Small. bass	0.1154	2.5270	0	0	178	896	756	224	3	2,057
Muskellunge	0.0003	0.0061	0	0	1	4	0	0	0	5
Other	0.0135	0.2948	12	82	122	7	2	9	6	240
Released										
Coho salmon	0.0001	0.0012	0	1	0	0	0	0	0	1
Yellow perch	0.0461	1.0098	0	1	249	42	23	265	242	822
Walleye	0.0114	0.2494	41	102	1	18	9	11	21	203
Small. bass	0.6350	13.9079	40	2,610	3,367	1,771	1,877	853	803	11,321
Muskellunge	0.0602	1.3194	1	1	366	330	200	100	76	1,074
Other	0.0919	2.0135	68	319	1,173	14	8	37	20	1,639
Angler hours			1,467	2,865	3,640	3,835	3,095	1,634	1,292	17,828
Angler trips			259	457	560	617	478	261	194	2,826
Charter excursions			81	149	167	167	126	66	58	814

[1]October and November values combined.

Table 4.—Commercial harvest (pounds caught) from Michigan waters of Lake Erie, 1981 to 2011.

Year	Buffalo	Bullhead	Common carp	Channel catfish	Gizzard shad	Goldfish	Quillback	Freshwater drum	Sucker	White bass	White perch	White-fish	Grand Total
1981	29,774	10,183	661,868	49,147	0	0	0	0	0	14,322	0	0	765,294
1982	22,474	58	676,896	20,354	76,000	0	1,430	608	178	1,742	0	0	799,740
1983	7,837	997	622,604	28,990	665,000	0	1,510	3,555	185	12,042	0	0	1,342,720
1984	789	152	422,571	9,208	1,265,200	0	56,061	116	44	2,041	0	0	1,756,182
1985	7,885	7,340	738,857	9,253	878,000	0	80,018	905	1,378	4,764	0	0	1,728,400
1986	14,732	7,687	367,310	11,183	0	0	2,217	2,032	123	1,397	0	0	406,681
1987	17,814	4,462	685,395	39,603	0	551	1,062	1,825	88	4,142	0	0	754,942
1988	9,471	5,421	417,365	15,208	0	188	1,380	1,180	0	1,049	0	0	451,262
1989	19,549	3,572	194,320	11,481	0	2,951	568	0	0	991	0	0	233,432
1990	40,064	488	158,151	2,025	0	877	0	0	0	0	0	0	201,605
1991	0	704	206,244	1,941	0	466	6,894	0	0	19	8	0	216,276
1992	0	444	251,365	2,929	2,845	1,025	30,204	290	0	357	10	0	289,469
1993	0	844	238,805	9,152	395	501	28,175	4,206	0	1,180	0	0	283,258
1994	0	659	94,662	5,760	2,103	111	8,930	111	0	1,819	0	0	114,155
1995	0	827	329,262	16,168	23	517	66,013	39,673	436	1,850	64	0	454,833
1996	104	828	387,671	24,969	36,996	7,138	73,662	48,218	4,286	2,923	45	0	586,840
1997	91,877	744	325,433	17,936	24,494	10,497	33,937	8,823	72	7,306	4	0	521,123
1998	15,721	2,139	620,015	16,573	4,988	6,862	22,990	24,507	6,180	1,326	0	0	721,301
1999	25,894	7,050	211,055	7,561	6,200	0	0	265	1,945	23	0	0	259,993
2000	27,843	1,742	313,200	14,400	4,595	3,025	0	0	0	1,776	0	0	366,581
2001	24,393	1,197	185,495	16,328	55	8,281	310	2,935	0	492	0	0	239,486
2002	45,367	6,500	336,820	39,778	6,655	4,660	1,300	4,035	0	3,810	0	0	448,925
2003	9,350	900	65,020	7,890	0	0	2,150	0	0	0	0	0	85,310
2004	18,883	1,650	97,380	23,600	5,120	0	3,400	0	550	1,973	0	0	152,556
2005	96,621	5,495	319,700	15,657	14,910	78,333	1,600	331	2,390	1,338	0	0	536,375
2006	85,269	7,277	378,123	42,931	52,382	67,171	5,030	7,876	1,410	5,237	796	10,693	664,195
2007	215,282	12,536	241,356	98,979	242,695	39,140	9,900	67,072	9,712	77,249	35,946	8,800	1,058,667
2008	142,726	31,969	204,881	71,385	134,008	84,361	2,257	137,304	11,244	98,041	56,867	0	975,043
2009	130,295	45,294	196,888	63,725	122,379	90,771	3,900	116,312	11,339	96,456	34,522	9,439	921,320
2010	68,511	47,612	191,321	64,913	0	77,550	107,037	130,533	7,919	37,021	19,524	963	752,904
2011	107,610	57,670	401,034	138,540	0	84,857	84,727	227,873	17,435	47,058	31,949	4,155	1,202,908
Grand Total	1,276,135	274,441	10,541,067	897,567	3,545,043	569,833	636,662	830,585	76,914	429,744	179,735	34,050	19,291,776

Table 5.—Commercial harvest (pounds sold) from Michigan waters of Lake Erie in 2011.

Species	Harvest (lbs.)	% of total harvest	Reported market value
Carp	391,165	33%	$100,873
Freshwater drum	223,350	19%	$47,049
Channel catfish	132,650	11%	$52,908
Buffalo	104,847	9%	$58,492
Goldfish	86,051	7%	$71,296
Quillback	84,101	7%	$21,336
Bullhead	54,880	5%	$22,711
White bass	46,356	4%	$41,171
White perch	31,949	3%	$15,274
Sucker	17,114	1%	$3,717
Whitefish	4,155	<1%	$4,155
Grand Total	1,176,618	100%	$438,982

Table 6.—Walleye CPUE (number per net lift) in multi-filament gill nets during fall surveys on Michigan waters of Lake Erie.

Year	Total	Survey year																	
Class	CPUE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1979	72.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1980	92.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1981	72.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1982	306.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1983	34.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1984	147.7	0.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1985	177.2	1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1986	297.5	2.0	0.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1987	127.8	3.8	1.0	0.5	0.8	–	0.3	–	–	–	–	–	–	–	–	–	–	–	–
1988	125.0	4.5	0.5	0.8	0.8	0.0	–	–	–	–	–	–	–	–	–	–	–	–	–
1989	52.6	3.3	1.3	0.8	0.8	0.3	0.3	–	–	–	–	–	–	–	–	–	–	–	–
1990	136.4	16.5	1.5	1.3	1.3	0.0	0.3	–	–	–	–	–	–	–	–	–	–	–	–
1991	194.3	61.5	11.3	6.8	2.8	1.3	0.3	–	–	–	–	–	–	–	–	–	–	–	–
1992	17.0	7.3	2.0	0.3	1.5	2.3	1.0	0.3	–	–	–	0.3	–	–	–	–	–	–	–
1993	170.3	73.3	71.0	11.8	8.0	3.3	1.5	0.3	0.5	–	–	0.3	0.3	–	–	–	–	–	–
1994	131.8	–	63.3	43.0	14.0	4.8	2.8	1.8	0.8	–	–	0.8	0.5	–	–	–	–	–	–
1995	10.7	–	–	3.3	1.3	0.8	1.0	0.8	0.8	0.3	–	0.8	0.8	0.5	0.3	–	–	–	–
1996	180.0	–	–	–	37.5	84.3	30.5	13.3	9.8	1.8	1.0	1.5	0.3	0.0	0.0	–	–	–	–
1997	134.1	–	–	–	–	54.3	34.3	20.3	15.3	3.0	1.0	3.8	1.0	0.3	0.5	–	–	0.3	–
1998	83.2	–	–	–	–	–	26.0	29.5	14.8	6.3	1.0	3.8	1.0	0.3	0.0	–	–	0.5	–
1999	181.3	–	–	–	–	–	–	57.0	73.3	21.5	5.8	13.0	6.8	1.5	1.3	0.3	0.5	0.3	–
2000	22.0	–	–	–	–	–	–	–	6.5	6.3	0.8	4.0	2.0	0.8	1.0	0.0	0.0	0.3	0.3
2001	134.3	–	–	–	–	–	–	–	–	42.8	32.5	43.8	10.0	1.8	1.8	1.0	0.0	0.3	0.3
2002	14.4	–	–	–	–	–	–	–	–	–	0.8	4.0	6.5	2.3	0.8	0.0	0.0	0.0	0.0
2003	333.3	–	–	–	–	–	–	–	–	–	–	81.2	157.5	48.3	28.0	7.5	7.8	1.0	2.0
2004	11.0	–	–	–	–	–	–	–	–	–	–	–	3.8	2.3	3.3	0.5	0.3	0.5	0.3
2005	36.9	–	–	–	–	–	–	–	–	–	–	–	–	12.3	17.0	2.5	3.8	0.5	0.8
2006	4.9	–	–	–	–	–	–	–	–	–	–	–	–	–	1.8	1.3	0.8	0.5	0.5
2007	117.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	69.0	32.8	11.5	4.5
2008	19.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	11.8	5.5	2.0
2009	19.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12.3	7.0
2010	24.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	24.0
Total		173.7	152.2	68.6	68.8	151.4	98.3	123.3	121.8	82.0	42.9	157.3	190.5	70.0	55.8	82.1	57.8	33.5	41.7
Net lifts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Table 7.—Mean catch per trap net lift for species commonly taken during spring trap net surveys in Anchor Bay, Lake St. Clair.

	Survey year										
Species	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean
Black crappie	0.00	0.02	0.35	0.00	0.00	0.00	0.00	0.05	0.02	0.13	0.06
Bluegill	0.08	0.00	0.11	0.03	0.05	0.00	0.11	0.00	0.02	0.52	0.09
Bowfin	0.00	0.04	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Brown bullhead	0.03	0.02	0.03	0.00	0.02	0.02	0.00	0.05	0.04	0.04	0.03
Channel catfish	3.81	4.14	3.92	2.50	4.33	4.24	6.31	5.41	4.06	2.81	4.15
Common carp	0.52	0.62	1.30	0.32	0.88	0.60	0.26	0.86	0.87	0.67	0.69
Freshwater drum	2.07	10.80	3.65	0.70	8.24	1.10	0.80	1.32	2.20	1.26	3.21
Gizzard shad	0.05	0.08	0.02	0.06	0.02	0.02	0.00	0.00	0.00	0.02	0.03
Golden redhorse	0.02	0.04	0.04	0.06	0.05	0.02	0.00	0.14	0.00	0.02	0.04
Lake sturgeon	0.03	0.14	0.07	0.03	0.10	0.00	0.17	0.09	0.04	0.24	0.09
Largemouth bass	0.36	0.10	0.25	0.06	0.07	0.18	0.20	0.23	0.18	0.52	0.22
Muskellunge	0.64	0.56	1.41	1.64	1.09	1.02	0.29	1.77	0.37	0.30	0.91
Northern pike	1.87	0.30	1.30	2.00	2.05	1.30	1.03	1.59	1.72	2.56	1.57
Pumpkinseed	4.96	1.54	1.12	0.05	0.52	0.82	0.91	0.82	1.00	3.52	1.53
Quillback carpsucker	0.38	0.30	0.60	0.15	0.91	0.12	0.60	0.86	0.72	0.56	0.52
Rock bass	49.50	32.00	33.80	12.30	35.10	42.50	40.43	62.91	93.46	100.2	50.22
Shorthead redhorse	1.84	4.08	1.53	1.44	4.00	0.80	1.97	1.68	2.87	2.87	2.31
Silver redhorse	0.50	0.66	1.29	1.26	2.98	0.62	1.91	2.91	2.37	3.00	1.75
Smallmouth bass	6.23	19.20	5.49	3.32	8.21	11.80	5.29	6.91	13.63	16.22	9.63
Walleye	3.79	3.60	2.67	5.50	5.12	3.58	2.54	4.27	1.91	4.85	3.78
White bass	0.03	0.10	0.07	0.00	0.14	0.12	0.54	1.00	0.26	0.61	0.29
White perch	0.20	0.10	0.80	0.12	2.38	0.20	1.17	0.96	0.93	1.81	0.87
White sucker	0.28	0.20	0.27	0.20	0.43	0.52	0.31	0.14	0.15	0.50	0.30
Yellow perch	4.89	1.14	5.01	0.97	1.26	2.54	2.94	1.00	0.54	3.02	2.331
Total all species	82.07	79.78	68.00	32.71	77.97	72.12	67.80	94.95	127.36	146.27	84.90
Number of net lifts	64	50	55	34	42	50	35	22	54	54	
Starting date	5/3	5/28	5/3	5/11	5/5	5/3	5/6	5/8	5/3	4/25	
Ending date	5/30	6/20	5/26	5/25	5/24	5/22	5/20	5/20	5/24	5/25	
Starting water temperature (^{0}C)	9	12	8	9	13	9	13	12	14	9	
Ending water temperature (^{0}C)	15	16	15	13	13	13	11	14	17	13	
Average secchi depth (m)	1.8	2.2	1.2	2.2	1.7	2.6	2.1	1.5	1.7	1.3	

Table 8.—Mean density (number of fish caught per hectare trawled) for all fish species caught during spring (June) with 10 m headrope index trawls in Anchor Bay, Lake St. Clair.

	Year														
Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean
Alewife	3	2	4	3	3	0	0	0	0	0	0	0	0	0	3
Bluntnose minnow	0	0	11	10	7	1	6	118	1	13	0	3	2	4	11
Common carp	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Emerald shiner	0	0	5	0	11	0	2	0	0	0	32	39	4	18	7
Freshwater drum	5	2	1	5	1	4	3	6	4	3	0	0	0	2	3
Johnny darter	7	0	0	0	0	0	3	2	0	7	2	17	3	4	4
Lake sturgeon	0	0	0	0	1	1	0	0	2	1	0	0	0	0	0
Largemouth bass	0	0	0	1	0	0	0	0	0	4	0	0	1	0	0
Logperch	83	8	0	2	8	0	42	6	0	1	3	29	13	107	24
Muskellunge	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0
Northern pike	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0
Shorthead redhorse	1	7	3	4	7	4	2	6	9	1	0	0	4	1	4
Pumpkinseed	0	0	0	2	0	0	0	0	1	1	0	0	0	0	0
Quillback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow smelt	4	4	4	61	0	14	53	11	6	1	68	110	122	18	108
Rock bass	5	1	13	30	39	18	5	10	33	73	4	2	21	4	20
Round goby	28	6	11	1	30	6	53	10	0	30	1	14	33	24	17
Sand shiner	2	0	14	20	362	0	118	45	2	640	4	15	0	20	80
Silver lamprey	0	1	0	0	0	1	1	0	5	2	0	0	1	0	1
Silver redhorse	0	0	1	0	2	5	2	1	1	2	0	0	1	4	1
Smallmouth bass	1	0	1	3	4	2	2	10	4	13	0	0	2	2	3
Spottail shiner	8	69	935	7	5,730	211	1,777	524	769	53	90	2,705	495	5,093	1,173
Trout-perch	99	154	34	11	265	13	108	65	248	7	2	3	23	13	101
Walleye	1	2	1	1	1	1	0	2	12	2	0	1	0	0	2
White perch	0	0	13	1	1	1	2	1	2	0	1	1	0	1	2
White sucker	4	0	3	1	61	2	68	22	5	1	20	16	95	9	20
Yellow perch	250	867	158	1,132	725	306	888	1,107	869	303	3,137	7,144	3,120	3,101	1,553

Table 9.—Mean density (number of fish caught per hectare trawled) for all fish species caught during fall (September or October) with 10 m headrope index trawls in Anchor Bay, Lake St. Clair.

	Year														
Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean
Alewife	12	2	3	32	0	0	0	1	1	0	0	5	0	0	7
Bluntnose minnow	0	9	15	54	33	13	43	238	61	36	65	198	821	189	113
Common carp	0	0	0	1	2	0	0	1	0	0	0	0	0	1	0
Emerald shiner	8	0	0	0	1	0	41	36	608	0	1	8	2	5	45
Freshwater drum	0	1	1	2	0	1	5	2	3	2	0	2	2	0	1
Johnny darter	0	0	0	0	0	7	0	0	0	1	1	0	0	1	2
Lake sturgeon	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0
Largemouth bass	0	3	2	16	36	13	13	29	22	58	50	45	23	9	20
Logperch	21	1	5	18	6	14	38	113	34	9	175	288	120	31	59
Muskellunge	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Northern pike	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0
Shorthead redhorse	0	0	1	2	0	0	0	1	2	1	0	0	0	1	0
Pumpkinseed	0	2	0	5	5	3	1	0	5	8	24	0	0	5	4
Quillback	1	0	1	0	2	1	1	0	0	0	5	0	0	0	1
Rainbow smelt	0	0	1	0	0	4	26	0	1	0	1	139	0	1	12
Rock bass	1	89	93	40	41	35	25	77	67	71	211	21	104	80	66
Round goby	22	10	10	10	99	2	28	14	10	4	7	11	15	0	20
Sand shiner	0	30	15	10	44	507	8,909	3,072	109	29	408	0	0	383	930
Silver lamprey	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0
Silver redhorse	1	0	0	1	6	0	4	5	4	1	1	2	1	1	2
Smallmouth bass	25	11	6	0	51	7	3	41	32	3	22	2	69	13	19
Spottail shiner	45	200	51	879	2,407	1,068	545	2,410	2,668	983	2,191	981	2,492	1,867	1,206
Trout-perch	26	3	0	0	10	6	59	3	79	1	0	3	105	7	73
Walleye	3	1	1	0	11	0	2	9	3	1	0	2	0	2	3
White perch	8	0	0	0	13	8	6	146	12	31	398	9	9	1	42
White sucker	0	0	1	1	8	1	1	4	6	5	7	6	10	1	3
Yellow perch	69	22	41	114	73	181	48	52	34	220	625	1,100	2,601	36	330

Table 10.—Catch rate (number per 10 minute tow) by age for yellow perch in June index trawl tows on Lake St. Clair.

Year	Total	Survey year														
class	CPUE	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1985	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1986	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1987	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1988	3	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1989	7	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1990	24	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1991	117	13	5	1	–	–	–	–	–	–	–	–	–	–	–	–
1992	51	10	18	1	0	1	–	1	–	–	–	–	–	–	–	–
1993	581	114	54	54	2	3	–	1	–	–	–	–	–	–	–	–
1994	903	348	53	21	8	11	1	1	–	1	–	–	–	–	–	–
1995	148	41	7	32	12	21	10	3	1	0	–	–	–	–	–	–
1996	280	33	109	70	11	35	10	9	1	1	–	–	–	–	–	–
1997	218	–	4	38	6	53	61	44	4	8	1	–	–	–	–	–
1998	1,355	–	–	650	114	348	84	118	23	18	0	–	–	–	–	–
1999	103	–	–	–	5	26	18	25	23	4	3	0	–	–	–	–
2000	82	–	–	–	–	3	5	5	43	21	2	4	–	–	–	–
2001	312	–	–	–	–	–	131	90	50	25	12	4	0	–	–	–
2002	89	–	–	–	–	–	–	9	11	6	12	51	0	–	–	–
2003	1,371	–	–	–	–	–	–	–	705	397	175	26	46	22	1	–
2004	284	–	–	–	–	–	–	–	–	9	158	18	78	17	1	3
2005	261	–	–	–	–	–	–	–	–	–	34	26	150	36	10	6
2006	327	–	–	–	–	–	–	–	–	–	–	5	108	99	32	84
2007	3,565	–	–	–	–	–	–	–	–	–	–	–	1,003	1,718	647	198
2008	2,283	–	–	–	–	–	–	–	–	–	–	–	–	1,265	625	393
2009	216	–	–	–	–	–	–	–	–	–	–	–	–	–	64	153
2010	533	–	–	–	–	–	–	–	–	–	–	–	–	–	–	533
Total		560	250	867	158	500	320	306	860	489	395	134	1,386	3,155	1,378	1,370